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10/552,260	10/05/2005	Ryouichi Shimoi	050340-0193	6538

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EXAMINER	
PARSONS, THOMAS H	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,260	SHIMOI ET AL.	
	Examiner	Art Unit	
	THOMAS H. PARSONS	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-11 and 19-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 5-11, 19-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment

This is in response to the Amendment filed 21 November 2008.

(*Previous*) DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The rejection of claims 1-4 under 35 U.S.C. 102(b) as being anticipated by Johnson (6,124,051) have been **withdrawn** in view of Applicants' Amendment.

2. Claims 1-4, 5, 7, 9 and 22-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Romanowski et al. (US 5,132,174).

Claim Rejections - 35 USC § 103

3. The rejection of claims 5-11 and 19-23 under 35 U.S.C. 103(a) as being unpatentable over Johnson (6,124,051) in view of WO 01/48846) have been **withdrawn** in view of Applicants' Amendment.

4. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,124,051).

Response to Arguments

5. Applicant's arguments with respect to claims 1-4, 5-11 and 19-26 have been considered but are **moot** in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3, 5-11 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,124,051) in view of WO 01/48846 (hereafter WO '846).

Claim 1: Johnson in Figures 1-3 discloses a fuel cell assembly comprising:

a fuel cell stack (25) formed by laminating a plurality of cells (15);

plus and minus current extraction sections (bus plates 16, 14), the current extraction sections sandwiching the fuel cell stack with respect to the direction of lamination, each current extraction section comprising a current extraction plate (bus plate 16, 14) which is fixed to an end cell positioned on an end of the fuel cell stack, and an end plate (endplates 18, 17); and

a passage (70) allowing flow of a gas provided for at least one of the current extraction sections plate and the end plate (Figure 2). See col. 3: 20-col. 9: 5.

The recitation "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Johnson appears capable of providing the claimed process.

Johnson does not disclose that a catalyst for combusting the gas is applied to a wall face of the passage.

WO '846 discloses a passage allowing a flow of a gas wherein a catalyst for combusting the gas is applied to a wall face of the passage (page 16, lines 33-36, page 17, lines 24-27, page 9, line 34 through page 10, line 6, page 4, lines 18-25, page 5, lines 21-34, and page 27, line 29 through page 28, line 19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Johnson by incorporating the catalyst device of WO '846 because both are concerned with allowing flow of a gas during normal operation, WO '846 is further concerned with allowing flow of a gas during startup at a temperature below freezing (page 2, line 29 through page 3, line 14), and because WO '846 teaches a catalyst that would have provided for the combustion of fuel or oxidant within the react or coolant pathways within the stack, thereby increasing the temperature of the stack on startup or maintaining a desired operating temperature during operation, without requiring an external heating source.

Claim 2: Johnson further discloses that the passage for the gas is formed between the current extraction plate (16) and the end plate (17) (Figure 2).

Claim 3: Johnson further discloses that the passage being is formed inside at least one of the current extraction plate and the end plate (col. 3: 57-col. 5: 62).

Claim 5: Johnson in Figures 1-3 discloses a fuel cell assembly comprising:

a fuel cell stack (25) formed by laminating a plurality of cells (15);

plus and minus current extraction sections (bus plates 16, 14), the current extraction sections sandwiching the fuel cell stack with respect to the direction of lamination, each current

extraction section comprising a current extraction plate (bus plate 16, 14) which is fixed to an end cell positioned on an end of the fuel cell stack, and an end plate (endplates 18, 17); and

a passage allowing flow of a fluid provided for at least one of the current extraction sections plate and the end plate (Figure 2). See col. 3: 20-col. 9: 5.

The recitation "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Johnson appears capable of providing the claimed process.

Johnson does not disclose a heating device for heating the passage for the fluid.

WO 01/48846 in Figures 1-3 discloses a heating device for heating the passage for the fluid (page 16, lines 33-36, page 17, lines 24-27, page 9, line 34 through page 10, line 6, page 4, lines 18-25, page 5, lines 21-34, and page 27, line 29 through page 28, line 19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Johnson by incorporating the catalyst device of WO '846 because both are concerned with allowing flow of a gas during normal operation, WO '846 is further concerned with allowing flow of a gas during startup at a temperature below freezing (page 2, line 29 through page 3, line 14), and because WO '846 teaches a catalyst that would have provided for the combustion of fuel or oxidant within the react or coolant pathways within the stack, thereby increasing the temperature of the stack on startup or maintaining a desired operating temperature during operation, without requiring an external heating source.

Further, Johnson does not disclose a control valve which is opened to supply the fluid to the passage during startup of the fuel cell stack and which is closed to stop supplying the fluid to the passage under normal conditions of the fuel cell stack after the startup.

WO '486 in Figures 1-4 disclose a control valve (e.g. 450 in Figure 4) which is opened (via control 445) to supply the fluid to the passage during startup of the fuel cell stack and which is closed (via control 455) to stop supplying the fluid to the passage under normal conditions of the fuel cell stack after the startup.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Johnson by incorporating the control valve WO '846 because both are concerned with allowing flow of a gas during normal operation, WO '846 is further concerned with allowing flow of a gas during startup at a temperature below freezing (page 2, line 29 through page 3, line 14), and because WO '846 teaches a control valve that would have controlled the flow of fluid to the passage and the combustion of fuel or oxidant within the react or coolant pathways within the stack, thereby increasing the temperature of the stack on startup or maintaining a desired operating temperature during operation, without requiring an external heating source.

Claim 6: WO '486 further discloses that the fluid is combustible (i.e. hydrogen, which is the same combustible fluid as that instantly disclosed) and the heating device comprises a catalyst applied to the passage (page 9, line 34 through page 10, line 6).

Claim 7: The recitation "wherein the heating device heats the fluid and supplies the heated fluid to the passage" has been considered, and construed as a process limitation that adds no additional structure.

However, WO '486 in Figure 1 further discloses that the heating device (heat exchanger 142 in Figure 1) heats the fluid and supplies the heated fluid to the passage.

Claim 8: WO '486 further discloses that the fluid is combustible (i.e. hydrogen, which is the same combustible fluid as that instantly disclosed) and the heating device comprises an ignition device (page 9, line 34 through page 10, line 6).

Claim 9: The recitation "wherein the heating device heats at least one of the current extraction sections when the fuel cell stack is started up", has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, WO '486 discloses that the heating device heats at least one of the current extraction sections when the fuel cell stack is started up (page 1, lines 7-18)

Claim 10: WO '486 in Figure 1-3 further that the heating device comprises means (page 9, line 34 through page 10, line 6) for combusting cathode gas for the fuel cell stack (page 16, lines 33-36, and page 17, lines 23-26).

The recitation, "the heating device heats at least one of the current extraction sections using the heat of combustion" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, because the fuel cell system of the Johnson combination is structurally similar to that instantly disclosed, it appears capably of providing the claimed process.

Claim 11: WO '486 in Figures 1-3 disclose that the heating device comprises means for combusting a gaseous mixture of cathode gas and anode gas for the fuel cell stack (page 9, line 34 through page 10, line 6, page 16, lines 33-36, and page 17, lines 23-26).

The recitation, "the heating device heats at least one of the current extraction sections using the heat of combustion" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, because the fuel cell system of the Johnson combination is structurally similar to that instantly disclosed, it appears capably of providing the claimed process.

Claims 19 and 21: The recitation ", wherein the anode gas is an anode gas discharged from the fuel cell stack" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, because the fuel cell system of the Johnson combination is structurally similar to that instantly disclosed, it appears capably of providing the claimed process.

In addition, WO '846 discloses, "In the fuel cell power generation systems illustrated in FIGS. 1-3, other conduit and/or valving configurations may be suitable, depending upon the application, provided that at least a portion of the fuel and oxidant streams can be diverted to the coolant pathway". Therefore, it would have been within the skill of one having ordinary skill in the art at the time the invention was made to have modified the valving of the Johnson combination to provide an anode gas discharged from the fuel cell stack.

Claim 20: WO '486 in Figures 1-3 further disclose that the heating device (page 9, line 34 through page 10, line 6) comprises means (121) for supplying anode gas (120) for the fuel cell stack to the current extraction sections after supplying cathode gas (130) for the fuel cell stack to the current extraction sections and means for combusting the gaseous mixture of anode gas and cathode gas. See also page 16, line 33 through page 17, line 20).

Claim 22: Johnson further discloses that the passage for the fluid is formed between the current extraction plate and the end plate (Figure 2).

Claim 23: Johnson further discloses that the passage being is formed in at least one of the current extraction plate and the end plate (col. 3: 57-col. 5: 62).

8. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,124,051).

Claim 24: Johnson in Figures 1-3 discloses a fuel cell assembly comprising:

a fuel cell stack (25) formed by laminating a plurality of cells (15);

plus and minus current extraction sections (bus plates 16, 14), the current extraction sections sandwiching the fuel cell stack with respect to the direction of lamination, each current extraction section comprising a current extraction plate (bus plate 16, 14) which is fixed to an end cell positioned on an end of the fuel cell stack, and an end plate (endplates 18, 17); and

an enclosed cavity for containing gas therein at least one of the current extraction sections (i.e. compression plate 17 sealed against bus plate 16 by sealing plate 28, as shown in Figure 1, has been construed as an enclosed cavity). See col. 3: 20-col. 9: 5.

Johnson does not disclose that the gas is sealed in the enclosed cavity at reduced pressure.

However, it would have been an obvious matter of choice to one with ordinary skill in the art at the time of the invention to seal the gas at a reduced pressure, since the Applicant has not disclosed that this configuration provides any criticality and/or unexpected results and it appears that the invention would perform equally well with any contained gas such as that taught by Johnson.

Johnson does not disclose the end plate is formed from a material which has a lower coefficient of thermal conductivity than a material for forming the current extraction plate.

However, one skilled in the art would know that if the endplate has a lower coefficient of thermal conductivity than that of the current extraction plate, heat generated becomes localized, and can assist in melting frozen water thereby improving overall fuel cell performance and service life.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Johnson by incorporating an endplate having a lower coefficient of thermal conductivity than that of the current extraction plate so as to localize heat generation and assist in melting frozen water, thereby improving fuel cell performance, startup, and service life.

Claim 25: Johnson further discloses that the enclosed cavity is formed between the current extraction plate and the end plate.

Claim 26: Johnson further discloses that the enclosed cavity being formed inside at least one of the current extraction plate and the end plate (e.g. turnaround grooves 29 in bus plate 14) (see col. 5: 14-62).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS H. PARSONS whose telephone number is (571)272-1290. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Thomas H Parsons
Examiner
Art Unit 1795

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